



PRIVATE WELL PROGRAM – 2008

Madison Water Utility

November 14, 2008

Madison Water Utility
Water Quality Section
119 E. Olin Avenue
Madison, WI 53713

Madison Water Utility – Private Well Program

Background

The Water Quality section of Madison Water Utility administers the Private Well Program for the City of Madison. The purpose of the program is to prevent groundwater contamination from unused, unsafe or non-complying wells in the City of Madison or premises served by Madison Water Utility. Details about the permitting process for private wells are described in the Well Abandonment Ordinance, Section 13.21 of the Madison General Ordinances. A Well Operation Permit, valid for a period of five years, may be issued after the well and pump installation have been shown to comply with provisions of Chap. NR 812 of the Wisconsin Administrative Code, produce bacteriologically safe water, and are not cross connected to the municipal water system. As of September 2008, 174 private wells are currently permitted in the City of Madison. Utility records show that an additional 169 wells have been abandoned.

Although the actual number is unknown at present, there is a potential for the identification of several hundred to a few thousand improperly abandoned private wells in the City of Madison. Many of these wells were the primary water source for properties that have since been annexed into the City of Madison or they were located on lots developed before municipal water service was available. The objectives of the Private Well Program are (1) to inspect, test, and permit operating wells in Madison and, (2) to identify and cause the abandonment of unused and non-complying private wells – potential conduits of contamination into the groundwater aquifer.

Phase I – Identify and Permit Known Private Domestic Wells

In spring 2008, staff from the Water Utility, City Engineering, and City Assessor's Office met to reconcile city records regarding private wells and septic systems. Records from the Assessor's Office indicated 163 properties that potentially had a private well. A Water Utility review of those data show that 63 of those properties have a permitted well, 9 had a well that has since been abandoned, and 83 had no information. The remaining entries corresponded to addresses where a well had been identified and the well was being permitted. Further review of the 83 properties with no information indicated that most of these properties either share a private well that is already permitted under another address, are part of a condominium association unlikely to have a well, or are currently being billed for water and not likely to be using a well. About twenty properties were suspected to have an active, non-permitted well. The property owners have been notified of their need to have the well inspected and permitted.

The Water Utility also consulted with staff from Public Health – Madison & Dane County to identify addresses with an active septic system. The search resulted in a list of 125 addresses that might also have a private well. Upon staff review, many of these locations either have a permitted well, had a well that was previously abandoned, or are in the process of permitting a well. Water Utility staff is investigating about 30 of these locations that are suspected of having a non-permitted but active well.

Finally, Water Utility staff has obtained well construction report records from the Department of Natural Resources (DNR) searchable database for all Dane County wells installed between 1988 and January 2008. Staff has narrowed its focus from nearly 12,000 to less than 600 wells located in the Madison area. Well construction reports often contain incomplete information regarding the location of the well. For example, well location was often reported by township, range, and section rather than by a specific address. In addition, local addresses often change when a parcel is incorporated into the City of Madison. Information from the searchable database will be used to identify locations of probable private wells. The Water Utility also recently obtained digitized well construction records for the period 1936-1989. Unfortunately, these WDNR records are not in database form and some information is incomplete and/or inaccurate.

When the Water Utility discovers or suspects the presence of a non-permitted well, a cover letter and Well Operation Permit application is mailed to the property owner. This action initiates the inspection and permit process. Currently, 30-35 private wells are at some stage of the permitting process. Water Utility staff is committed to working more closely with staff from the Assessor's Office to maintain accurate records regarding private wells particularly when new properties are annexed into the City of Madison and when a well has been newly permitted or abandoned.

Phase II – Identify Probable Locations of Unused, Improperly Abandoned Wells

Water Utility staff is taking multiple approaches to identify probable locations of unused and/or improperly abandoned wells. Dave Davis from City Engineering has created a map identifying land parcels in which the age of the house is older than the water main serving the land parcel. The lots are suspected of having a private well at some point in the past and may still have an unused, un-abandoned well. The map also shows locations identified by Water Utility staff and the Assessor's Office of a permitted or abandoned well. Additional analysis, using Water Utility billing records, is expected to identify properties where buildings are present and owners are billed for storm water but not water service. This information could indicate the likely presence of a domestic well.

Department of Natural Resources staff has provided the Water Utility with information from its abandoned wells database. The original list included 833 private wells – many of which are located in the surrounding communities of Fitchburg, Verona, Westport, and Middleton. This list has been narrowed to 180 private wells: 55 are currently in the Water Utility database, 102 are not in the database, and an additional 23 have incomplete address information. Although not identifying active wells, this information on locations of previously abandoned wells combined with other analysis can indicate clustered areas on which Water Utility staff should focus their attention.

Overall, the objective is to use the collective analysis to indicate clustered areas on which Water Utility staff should concentrate. Clusters have been identified by combining the datasets from Water Utility, Department of Natural Resources, Public Health – Madison & Dane County, and other city agencies regarding both active wells and those that were previously abandoned. The next step involves targeting the wellhead protection zones to locate possible unused, improperly abandoned domestic wells.

Proposed Approach

Issue initial notice as a bill insert or separate mailing. Information on the notice may include:

- A description of how a well is properly abandoned
- The importance of properly abandoning unused or non-complying private wells
- The well permitting process including cost, inspection process, and water testing
- The requirements for proper abandonment and potential cost
- Financial assistance that may be available

Target wellhead protection zones that are likely to have a high density of wells: Unit Well 14 (Figure 1), Unit Well 9 (Figure 2), Unit Well 12 (Figure 3), and Unit Well 7 (Figure 4).

Following the initial assessment, investigate for potential wells in other areas most likely to have high densities of private wells. These areas would include:

- North Madison – Troy Drive area
- South Madison – Waunona Way area
- Southeast Madison – Femrite Drive area
- East Madison – East Washington corridor at Stoughton Road
- Near West Madison – Orchard Drive to Park Street

For targeted areas, mail cover letter with information describing how to identify an unused or non-complying well and the well owner's responsibilities for either the proper abandonment or permitting of the well. The mailing could include a survey similar to the lead lateral survey for customers to self-report the presence or absence of a well. Any locations identified as having a well will be entered into our database and subsequently inspected, tested, and permitted or issued an abandonment notice. The Water Utility reserves the right to inspect any property regardless of the property owner's statement about the presence or absence of a well.

Alternatively, whenever a property within the wellhead protection areas previously identified is scheduled for a meter change-out, an inspection for a potential cross connections including the presence of a domestic well could also be scheduled. However, under this scenario, the approach would require additional staff in the Water Quality section or cross-training in cross connection control inspections for residential settings for the meter mechanics.

The following figures illustrate by example locations of known or suspected private wells within the wellhead protection zones (1200' radius, shaded in yellow) and 50-year or 100-year capture zones (shaded in pink) of four wells. Green parcels indicate a permitted well while orange ones indicate that the house is older than the water main. Red diamonds represent the approximate locations of a well documented in the WDNR database while the green circles and purple stars correspond to locations of properly abandoned wells.

Figure 1 – Unit Well 14 recharge area: Spring Harbor, the Highlands, Old Middleton Rd south to Regent Street between Whitney Way and Rosa Road.

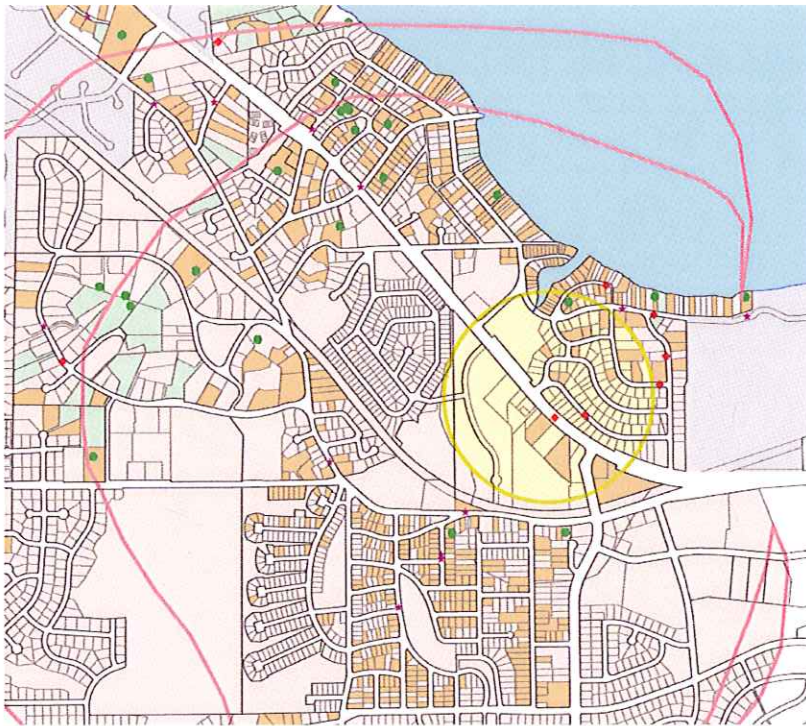


Figure 2 – Unit Well 9 recharge area: Blooming Grove annexation including area between Tulane Avenue and Crestview Drive from Monona Drive to Stoughton Road.

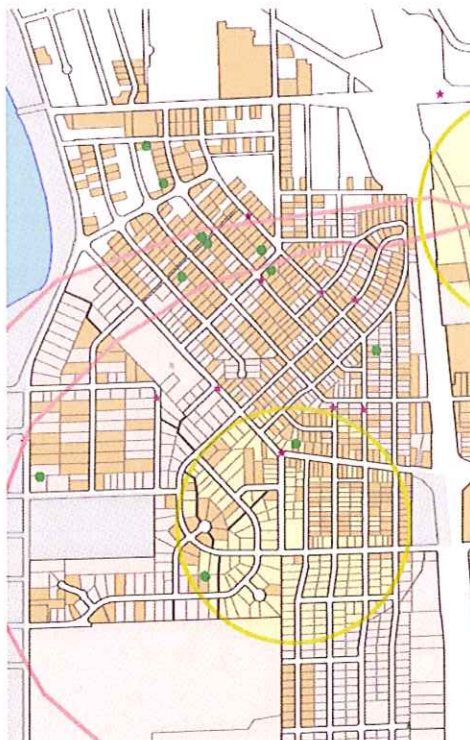


Figure 3 – Unit Well 12 recharge area: Between Schroeder Road and Hammersley Road, also commercial parcels north of Beltline highway.

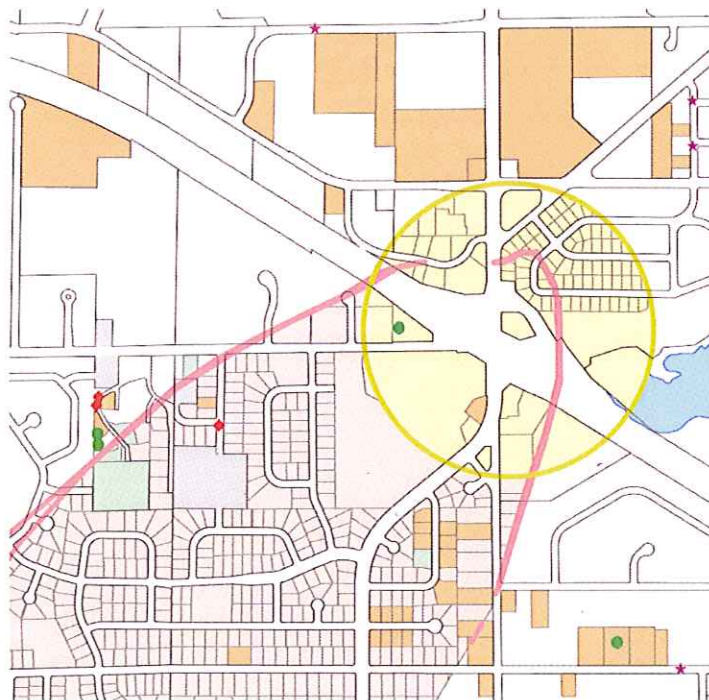


Figure 4 – Unit Well 7 recharge area: West of Packers Avenue between Commercial Avenue and Sachtjen Street.



Conclusions

Unknown private domestic wells in the City of Madison generally can be categorized as one of two types. Either the well serves a property recently annexed into the City or it is located in an older neighborhood where private wells were the primary water supply before municipal water service became available. Wells of the former classification are often still in use while those of the later category are less likely to be active. The fate of suspected, inactive wells is currently unknown but it is unlikely that the wells were properly abandoned through filling and sealing with an approved, impermeable material. Better dialogue with the Assessor's Office and staff from Public Health – Madison & Dane County will help track potential wells when properties are annexed into the City; however, locating inactive wells will require additional investigation by Water Utility staff.

One challenge with identifying the location of inactive and potentially improperly abandoned wells is inaccurate and/or incomplete records. Well construction records often only identify the well location by quarter section and not by street address. If address information is included, it may be incomplete or the information was accurate for the former municipality but it does not correspond to a current address in the City of Madison. Nevertheless, the analysis performed over the last several months has provided good information for targeted investigation into the location of probable private wells.

Acknowledgements

The Water Quality section acknowledges the assistance of Assessor's Office, Public Health – Madison & Dane County, and Department of Natural Resources staff in locating and updating records for known or suspected private wells within the City of Madison. Our staff owes Dave Davis and other Engineering staff a debt of gratitude for their time and effort in geo-coding and mapping locations of active and abandoned wells and their analysis into probable locations of other private wells.

APPENDIX

Q1. What is meant by the term well abandonment?

The proper abandonment of a private well involves more than no longer using the well or simply covering the well casing (metal tube) and ignoring it. Technically, the term **well abandonment** refers to filling and sealing of an unused well with an approved, impermeable material such as bentonite chips, concrete, or neat cement. Unused and improperly abandoned wells pose a significant threat to groundwater, the source of Madison's drinking water supply. More information is available on the DNR website, <http://dnr.wi.gov/org/water/dwg/Forms/wellabandonment.pdf>.

Q2. Why should I abandon my unused or non-complying private wells?

Private domestic wells represent potential conduits or direct pathways for surface contaminants to reach the groundwater supply. If your property is in a wellhead protection area, any groundwater contamination of your well will show up in the municipal water supply. Open holes in the basement or holes covered by cement blocks in the yard can be mistaken as drains for the sewage system. The proper abandonment of an unused well avoids the possibility of contamination by closing and sealing the connection between the surface and the groundwater below our feet. In addition, Madison General Ordinance 13.21 requires the abandonment of any unused or non-complying private well.

Q3. What must I do if I am currently using a private well located on my property?

Private domestic wells are permissible in the City of Madison as long as the well satisfies the three criteria for the issuance of a well operation permit:

- (1) The well and pump installation must comply with provisions of Chap. NR 812 of the Wisconsin Administrative Code,
- (2) The well must produce bacteriologically safe water; that is, the water must be free of coliform bacteria including *E. coli*, and
- (3) The private water system must not be cross-connected to the municipal water system.

If you want to keep your well, you must apply for a well operation permit and pay the \$100 application fee. Otherwise, you must abandon the well. A copy of the permit application is enclosed. Once we receive your application and fee, we will schedule an inspection to determine if the well is up to code and to ensure that it is not cross-connected to the municipal water supply. Finally, Water Utility staff will collect a water sample on two separate occasions. These samples will be sent to a certified drinking water laboratory (Wisconsin State Laboratory of Hygiene or Public Health – Madison & Dane County) and tested for coliform bacteria. If your well satisfies all three criteria you will be issued a well operation permit that is valid for five (5) years. If your well does not satisfy the code requirements, you will be required to bring the well and/or pump installation up to code or you will be required to abandon the well. Although the Water Utility only tests your well

for coliform bacteria once every five years, we highly recommend an annual test for coliform bacteria and nitrate. Other water quality testing is recommended at less frequent intervals (see enclosed brochure). Testing is also warranted if you detect any noticeable change in the color, taste, or odor of the water produced by your well.

Q4. What should I do if I find evidence of a potential unused well on my property?

You received this notice because the Water Utility believes there is, or previously was, a private well on your property. Please contact the Water Utility at 266-4654 if there is any evidence of an unused or non-abandoned well or you have reason to believe a well may exist on your property. If you are not sure, Water Utility staff can perform a short, complementary inspection. You will be required to abandon any unused or non-abandoned well that does exist on your property. Please sign and return the attached form indicating whether or not you are aware of an unused or non-abandoned well on your property.

Q5. What are the requirements for the proper abandonment of a well?

As of June 1, 2008, only licensed well drillers and pump installers can fill and seal wells under Wisconsin Law. In addition, Water Utility staff must be on site during any well abandonment in the City of Madison. Please contact the Water Utility at 266-4654 at least 48 hours before scheduling the abandonment of your well. A list of licensed well drillers and pump installers is available on the DNR website, <http://dnr.wi.gov/org/water/dwg/Contacts.htm>.

Q6. What is the potential cost of a well abandonment?

The cost of a well abandonment depends on a number of factors, the primary ones being depth of the well and whether the pump is present and needs to be pulled. A "typical" abandonment costs \$500-\$1000 but may be more or less depending on the well depth and ease with which the pump can be removed. Well drillers typically charge by the foot so deeper wells are more expensive to abandon than shallow ones.

Q7. Is any financial assistance available to help pay for the well abandonment?

Financial assistance to pay for the abandonment of unused wells may be available through Wisconsin Department of Natural Resources or the Environmental Health section of the Dane County Department of Human Services.

The Wisconsin Department of Natural Resources offers a limited number of Well Abandonment Grants to help pay for the abandonment of unused private wells. Applicants must not exceed income thresholds to qualify. More information can be found at <http://dnr.wi.gov/org/caer/cfa/Grants/wellabnd.html>, or by calling the department at 266-8697 or 267-7152.

19-11

Madison Water Utility



Tom Heikkinen, P.E., General Manager

119 East Olin Ave.
Madison, WI 53713
Telephone: 608 266-4651
FAX: 608 266-4426

November 13, 2008

Water Utility Customer
119 E Olin Avenue
Madison, WI 53713

Dear Sir:

On November 14, 1990, Common Council adopted the Well Abandonment Ordinance, Section 13.21 of the Madison General Ordinances. Its purpose is to prevent groundwater contamination from unused, unsafe or non-complying wells. Meeting compliance with this ordinance will also ensure that there is no cross connection between the private well and municipal water system.

Our records list you as owner of property at **(119 E Olin Ave)**. We believe there is or may have been a private well at this location. The ordinance requires that a private well shall be properly abandoned, or a permit obtained to operate the well. Please review the enclosed information, complete the attached survey, and return the form to the Water Utility.

You must obtain a Well Operation Permit if you plan to continue using your well. Before receiving a permit, however, the well must satisfy the following criteria,

1. The well and pump installation must comply with provisions of Chap. NR 812 of the Wisconsin Administrative Code,
2. The well must produce safe water, as determined by bacteriological analysis, and
3. There must be no cross connections between the well and the municipal water system.

Should you decide to keep the well, submit within 30 days a completed well operation permit form and the \$100 permit fee for each well. The private well permit fee includes the cost of collecting and testing two water samples from your well. Samples will be taken at least two weeks apart and will be subject to bacteriological analysis only. Submit the permit form and fee to:

Madison Water Utility
Attn: Cherrie Dallmann
119 East Olin Avenue
Madison, WI 53713-1431

If you have any questions, you may contact Theresa Peters at 575-4959.

Sincerely,

Joseph Grande
Water Quality Manager



SAMPLE SURVEY FORM

www.madisonwater.org • 119 East Olin Avenue • Madison, WI 53713-1431 • TEL 608.266.4651 • FAX 608.266.4426

STATEMENT REGARDING PRIVATE WELL

I, (print your full name here) _____, make this statement based on my personal knowledge.

Section A (All recipients must complete this section.)

1. I am the ___Owner / ___Manager / ___Other* of the property at:

(Print property address here) _____
If you checked "Other" above, please explain what authority you have over the property:

2. I have ___ personally inspected / ___ had a licensed well driller/installer inspect the premises at the above address (both in the basement and outside) for any evidence of a private well.

If a licensed well driller/installer conducted the inspection, please provide the company name:

3. I have determined from the above inspection that the property ___does/ ___does not have any evidence of a private well.

If you had the well abandoned (properly filled and sealed), what was the year of the abandonment? _____

Who or what company performed the abandonment? _____

4. If there is any evidence of a private well, whether it is in active use or not, please complete Sections B and C on the reverse and return this form to the Water Utility. Otherwise, please skip to and complete Section C.

Section B (Complete this section only if you have a private well.)

1. The private well is ___active/ ___inactive.
2. To my knowledge, the last time the well produced water was: _____
3. If the well has been used in the last twelve months, does it serve (circle all that apply)
 - a. Inside taps or faucets? YES / NO
 - b. Outside taps or hydrants? YES / NO
 - c. Both inside and outside taps? YES / NO
 - d. Please list all fixtures served by the well:
4. Water from the well ___IS/ ___ IS NOT used for cooking or drinking.
5. To your knowledge, the water from the well was last tested: _____

Section C (All recipients must complete this section.)

I understand that the Madison Water Utility reserves the right to inspect any property for a private well regardless of the answers provided on this survey. To the best of my knowledge, the information I have provided in this statement is true and accurate.

(Signature)

Date _____.

Daytime phone number: _____

E-mail address: _____

Send this form to

MADISON WATER UTILITY
119 E. OLIN AVE
MADISON WI 53713
Fax: 608-266-4644

CHAPTER 13 – PUBLIC WATER SUPPLY SYSTEM

(Title Am. by Ord. 6665, Adopted 6-26-79; Am. by Ord. 12,357, Adopted 3-16-99)

Section

- 13.01 Water Utility Board. (Am. by ORD-07-00099, 8-23-07)
- 13.02 Appointment of General Manager; Duties.
- 13.03 Duties of General Manager.
- 13.04 Outdoor Water Usage Restrictions. (Cr. by Ord. 5569, 8-13-76)
- 13.05 Contracts for Lease of Water.
- 13.06 Access to Premises and Maintenance of Water Meter Pits. (Am. by ORD-06-00135, 10-6-06)
- 13.07 Service Connections.
- 13.08 Laying of Mains and Service Pipes When Streets are Paved.
- 13.09 Expense of Laying Service Pipes.
- 13.10 No Claims to be Allowed Against City for Interruption of Water Supply or Consequential Damage.
- 13.11 Opening of Fire Hydrants.
- 13.12 Collection of Water Utility Charges.
- 13.13 General Tax for Benefit of Water Utility.
- 13.14 Surplus Revenues.
- 13.15 Cross Connection Control. (Am. by Ord. 12,344, 3-2-99)
- 13.16 Fixing The Area in Which Water Service is to be Extended Beyond the Municipal Limits.
- 13.17 Adoption by Reference (Cr. by Ord. 12,357, Adopted 3-16-99)
- 13.18 Lead Water Service Line Replacement (Cr. by Ord. 12,544, 2-18-00)
- 13.19 Water Main Assessment Procedure. (R. & Recr. by Ord. 4902, 2-25-75)
- 13.20 Tampering with Water Meters Prohibited. (Cr. by Ord. 7848, 11-5-82)
- 13.21 Well Abandonment. (Cr. by Ord. 10,136, 11-14-90; Am. by Ord. 12,345, 3-2-99)
- 13.22 Wellhead Protection. (Cr. by Ord. 13,106, 7-23-02)
- 13.23 Penalty.

13.21 WELL ABANDONMENT.

- (1) Purpose. To prevent contamination of groundwater and to protect public health, safety and welfare by assuring that unused, unsafe or noncomplying wells, wells which may serve as conduits for contamination or wells which may be illegally cross-connected to the Madison Water Utility are properly abandoned.
- (2) Applicability. This ordinance applies to all wells located in the City of Madison or on premises served by the Madison Water Utility.
- (3) Definitions.

Noncomplying means a well or pump installation which does not comply with the provisions of Ch. NR 812, Wisconsin Administrative Code, in effect at the time the well was constructed, a contamination source was installed, the pump was installed or work was done on either the well or pump installation.

Pump installation means the pump and related equipment used for withdrawing water from a well including the discharge piping, the underground connections, pitless adapters, pressure tanks, pits, sampling faucets and well seals or caps.

Unsafe means a well or pump installation which produces water which is bacteriologically contaminated or contaminated with substances in excess of the standards of Chapters NR 809 or 140, Wisconsin Administrative Code, or for which a Health Advisory has been issued by the Department of Natural Resources.

Unused means a well or pump installation which is not in use or does not have a functional pumping system.

Well means an excavation or opening into the ground made by digging, boring, drilling, driving, or other methods for the purpose of obtaining groundwater for consumption or other use. Wells for the express purpose of monitoring the quality of ground water and/or gases and/or soil characteristics are exempt from this Ordinance.

Well abandonment means the filling and sealing of a well according to the provisions of Chap. NR 812, Wisconsin Administrative Code.

- (4) Abandonment Required. All wells located in the City of Madison or on premises served by the Madison Water Utility shall be abandoned if no valid well operation permit has been obtained from the Madison Water Utility or if so required under NR Sec. 812.26(2), Wisconsin Administrative Code. An application for a well operation permit shall be made within ninety (90) days of the date of any abandonment notice from the Madison Water Utility. (Am. by Ord. 12,567, 5-3-00)
- (5) Well Operation Permit. No person may operate a well without having obtained a well operation permit. The Madison Water Utility may grant a permit to a private well owner to operate a well for a period not to exceed five (5) years providing the conditions of this section are met. An owner may request renewal of a well operation permit by submitting information verifying that the conditions of this section are met. The Madison Water Utility, or its agent, may conduct inspections or have water quality tests conducted at the applicant's expense to obtain or verify information necessary for consideration of a permit application or renewal. Permit applications and renewals shall be made on forms provided by the Madison Water Utility. A permit fee of one hundred dollars (\$100) shall accompany the application. This fee shall include the cost of conducting bacterial examinations of water samples obtained from the well. The Madison Water Utility may require abandonment of a well for failure to renew a permit or to pay renewal fee within ninety (90) days of the date of any abandonment notice from the Madison Water Utility; otherwise, abandonment shall be required. The following conditions must be met for issuance or renewal of a well operation permit:
 - (a) The well and pump installation meet or are upgraded to meet the requirements of Chap. NR 812, Wisconsin Administrative Code.
 - (b) The well construction and pump installation have a history of producing bacteriologically safe water as evidenced by at least two (2) samplings taken a minimum of two (2) weeks apart. No exception to this condition may be made for unsafe wells, unless the Department of Natural Resources approves, in writing, the continued use of the well.
 - (c) There are no cross-connections between the well and pump installation and the Madison Water Utility. (Am. by Ord. 12,567, 5-3-00)
- (6) Required Inspection. Whenever real property with a well on the premises is conveyed pursuant to Chapter 706, Wisconsin Statutes, the seller shall contact the Madison Water Utility at least fourteen (14) days prior to the transfer of property. Upon proper notice, the Madison Water Utility may conduct an inspection to determine whether the well should be permitted or abandoned under this section.
- (7) A representative of the Madison Water Utility shall have the power and authority at all reasonable times, for any proper purpose, to enter upon any property in the City of Madison and make inspection thereof. If entry is refused, such representative may obtain a special inspection warrant under Section 66.0119, Wisconsin Statutes. Upon request by a representative of the Madison Water Utility, the owner, lessee or occupant of any property so served shall furnish to the inspection agency any pertinent information regarding the well on such property if such information is known to such owner, lessee or occupant. (Am. by Ord. 12,567, 5-3-00)

(8) Abandonment Procedures.

- (a) All wells abandoned under the jurisdiction of this ordinance or rule shall be abandoned according to the procedures and methods of Chap. NR 812, Wisconsin Administrative Code. All debris, pump, piping, unsealed liners and any other obstructions which may interfere with sealing operations shall be removed prior to abandonment.
 - (b) The owner of the well, or the owner's agent, shall notify the Madison Water Utility at least forty-eight (48) hours prior to commencement of any well abandonment activities. The abandonment of the well may be observed by the Madison Water Utility.
 - (c) An abandonment report form, supplied by the Department of Natural Resources, shall be submitted by the well owner to the Madison Water Utility and the Department of Natural Resources within ten (10) days of the completion of the well abandonment.
 - (d) The Madison Water Utility may require any person who has abandoned a well not in compliance with Subdivision (a) to return and take corrective action so that the well is abandoned by him or her in a complying manner. (Cr. by Ord. 12,567, 5-3-00)
- (9) This law does not supersede the State Plumbing Code, Section NR 811, Wisconsin Administrative Code, or Chapter 18 of the Madison General Ordinances entitled "Plumbing Code" but is supplementary to them.
- (10) Penalties. The penalty for violation of this section may be not less than twenty-five dollars (\$25) nor more than one thousand dollars (\$1,000) and the cost of prosecution. Each day of violation is a separate offense. If any person fails to comply with this ordinance for more than ten (10) days after receiving written notice of the violation, the City may impose a penalty and cause the well abandonment to be performed and the expense to be assessed as a special tax against the property.

(Sec. 13.21 Cr. by Ord. 10,136, 11-14-90; Am. by Ord. 12,345, 3-12-99; Am. by Ord. 12,567, 5-3-00; Ord. 13,500, 1-23-04)